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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/197,096	11/20/1998	MARK ALISTAIR POLETTI	0805774-0001	9905

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BOSTON, MA 02110

EXAMINER	
LAO, LUN S	

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/197,096	POLETTI, MARK ALISTAIR	
	Examiner	Art Unit	
	Lun-See Lao	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. This action responds to amendment filed on 10-04-2005. Claims 1-20 are cancelled and 21 and 33 have been amended and claims 21-41 are pending.

Continued Prosecution Application

2. The request filed on 10-24-2005 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 11-20-1998 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 21, 24, 26-28, 30-33, and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aarts (WO 98/23131) in view of Aarts (US PAT. 6,111,960).

Consider claim 21, Arats (131) teaches that a guitar preamplifier, comprising: electronic filters (see fig.1) having at least two stage (fig.1, (110, low pass filter and 160 high pass filter) and see page 5 lines 30-32) for splitting an input signal into two or more separate frequency bands (see fig.1, 110-160) each having a different center frequency (see fig.2), said filters comprising a substantially equi-phase (such as, no

extra phase shifts or delay) response wherein a phase response of each stage is substantiallv identical for each frequency band (see page 4 line 18-page 5 line 8);

a summing network for recombining said frequency bands (see fig.1,(170,180) and page 4 lines 7-17), but Aarts (131) does not clearly teaches two or more non-linear circuits, each of which distorts one of the frequency bands.

However, Aarts (960) teaches electronic filters having at least two stages (see fig.9 (21,20a-20n)) for splitting an input signal into two or more separate frequency bands each having a different center frequency (see fig.9 (21,20a-20n)) a phase response of each stage is substantiallv identical for each frequency band;

two or more non-linear circuits (23a-23n, (harmonic generator), each of which distorts one of the frequency bands; and a summing network (26) for recombining said frequency bands (see col.9 line 3-col. 10 line 5).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to utilize the teaching of Aarts (960) into Aarts (131) to provide a circuit for processing an audio signal, wherein any non-linear device may be used as a harmonics generator for generating any selection of harmonics desired.

Consider claim 24, Aarts(131) teaches that a preamplifier system of each low and high pass filter pair is a state variable filter (see Page 5 lines 9-32).

Regarding claims 26-27,37 Aarts(131) teaches that musical instrument preamplifier system of the filters further comprise variable cross-mixing (see fig.1, (170, 180)) after one or more stages of said filters (110-160 and see col. Page 4 line 7-page 5 line 8).

Consider claims 28 and 38 Aarts (960) discloses that a preamplifier of low pass filters (see fig.9, (24a-24n, bank pass filters at 20-30Hz low frequency) after said non-linear circuits (23a-24n) to reduce high frequency distortion products (see col.9 line 3-col. 10 line 5).

Consider 30-32, Aarts (960) teaches that a guitar preamplifier system of the non-linear circuit (see fig.9, 23a-23n) for each frequency band has a different gain (controlled by coefficient) than those in the other frequency bands; and non-linear circuits (23-23n) for higher frequency bands have a higher minimum gain than the non-linear circuits for lower frequency bands; and the distortion by said non-linear circuits (23a-23n) is variable (controlled by coefficient)(see col.6 line 18-53).

Consider claim 33, Arats (131) teaches that a digital preamplifier, comprising:

Digital electronic filters (see fig.1) having at least two stage (fig.1, (110, low pass filter and 160 high pass filter) and see page 5 lines 30-32) for splitting an input signal into two or more separate frequency bands (see fig.1, 110-160) each having a different center frequency (see fig.2), said filters comprising a substantially equi-phase (such as, no extra phase shifts or delay) response wherein a phase response of each stage is substantiallv identical for each frequency band (see page 4 line 18-page 5 line 8);

a digital summing network for recombining said frequency bands (see fig.1,(170,180) and page 4 lines 7-17), but Aarts (131) does not clearly teaches two or more non-linear circuits, each of which distorts one of the frequency bands.

However, Aarts (960) teaches digital electronic filters having at least two stages (see fig.9 (21,20a-20n)) for splitting an input signal into two or more separate frequency

bands each having a different center frequency (see fig.9 (21,20a-20n)) a phase response of each stage is substantiallv identical for each frequency band;

two or more non-linear circuits (23a-23n, (harmonic generator), each of which distorts one of the frequency bands; and a digital summing network (26) for recombining said frequency bands (see col.9 line 3-col. 10 line 5).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to utilize the teaching of Aarts (960) into Aarts (131) to provide a circuit for processing an audio signal, wherein any non-linear device may be used as a harmonics generator for generating any selection of harmonics desired.

5. Claims 22-23, 25, 29,34 and 39, are rejected under 35 U.S.C. 103(a) as being unpatentable over Aarts (WO 98/23131) as modified by Aarts (US PAT. 6,111,960) as applied to claims 21,33, and further in view of Orban (US PAT .4,412,100).

Consider claims 22 and 34 Aarts (131,960) differs from claims 22,34 in not disclosing that a preamplifier of filters comprises a cascade of 2^N - 1 pairs of even-poled low and high pass filters arranged such that each pair splits the incoming frequency band in two, where N is the number of stages of pairs in the cascade, and wherein for the nth stage subsequent to the first, each low or high pass filter pair is preceded by (2^{n-1} - 1) all pass filters with phase response corresponding to the (2^{n-1}- 1) other low and high pass filter phase response in that stage such that the phase response of each stage is similar for each frequency band.

However, Orban teaches that a preamplifier of filters comprises a cascade of 2^N - 1 pairs of even-poled low and high pass filters (see fig.3, (12,14 and 50,51)) arranged such that each pair splits the incoming frequency band in two (16,11 and 45,47, and 52,58 and 53,54), where N is the number of stages of pairs in the cascade, and wherein for the nth stage subsequent to the first, each low or high pass filter pair is preceded by (2^{n-1} - 1) all pass filters (12,47 and 50,54) with phase response corresponding to the (2^{n-1}- 1) other low and high pass filter phase response in that stage such f hat the phase response of each stage is similar for each frequency band (see col.3 line 19-col.4 line 23).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Orban into Aarts (131, 960) to provide the signal processor can generally be described as a distributed crossover system for use with bandpass filters containing internal clippers. A unique (series/parallel) crossover configuration with favorable summation of properties is used.

Consider claim 23, Orban teaches that a musical instrument preamplifier system of cascade has two stages of two pole low (see fig.3, (14,16,11,53,56) and high (51, 52,58,45,35) pass filter pairs.

Consider claim 25, Aarts (131) teaches that a preamplifier system of each low and high pass filter pair is a state variable filter (see Page 5 lines 9-32).

Consider claims 29 and 39, Orban teaches that a preamplifier system of the filters (see fig.3, (14,16,11,17,25)) are combined with said summing network (19,25) such that it successive stages the lowest frequency band is low pass filtered with a low

pass filter and the other frequency bands are all pass filtered (12,47,50,54) with an all pass filter corresponding to said low pass filter, said lowest frequency band is then combined with the next lowest frequency band, and comprising subsequent stages of repeated filtering and combining until all frequency bands are combined, such that the phase response over all frequency bands through the low pass filtering and summing (19,25,31) network is identical.

6. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aarts (WO 98/23131) as modified by Aarts (US PAT. 6,111,960) and Orban (US PAT. 4,412,100) as applied to claims 33-34, and further in view of Baker (US PAT. 4,589,135).

Consider claim 35, Aarts (131) teaches that a digital preamplifier each digital low pass and high pass filter (see fig.1 (110, low pass filter and 160, high pass filter) and see page 4 line7-page 5line 32); but Aarts (131) does not clearly teach a bilinear transformation of a corresponding low pass and high pass analogue filter, and the all pass filters are obtained by a bilinear transformation of a corresponding all pass analogue filter.

However, Baker teaches that a digital preamplifier each digital low pass and high pass filter (see fig.1 and col.5 lines 65) is obtained by a bilinear transformation of a corresponding low pass and high pass analogue filter (see fig.1), and the all pass filters are obtained by a bilinear transformation of a corresponding all pass analogue filter (see abstract and col.10 1-65).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Baker into the teaching of Aarts (131, 960) and Orban to provide a filtering system is useful in high fidelity speaker crossover systems, various electronic signal splitting or filtering circuits (whether analog or digital) wherein the information within individual frequency bands are to be isolated and treated independent of an adjacent frequency band yet ultimately recombined and the like.

7. Claim 36 rejected under 35 U.S.C. 103(a) as being unpatentable over Aarts (WO 98/23131) as modified by Aarts (US PAT. 6,111,960) as applied to claims 21,33, and further in view of Maag (US PAT. 5,892,833).

Consider claim 36, Aarts (131,960) fail to teach that a digital musical instrument preamplifier of the digital filters comprise linear phase finite impulse response filters.

However, Maag teaches that a digital musical instrument preamplifier of the digital filters comprise linear phase finite impulse response filters (see col.7 lines 50-67).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Maag in to Aarts to provide a new and improved digital equalizer system and method for processing and performing equalization on audio signals.

8. Claims 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aarts (WO 98/23131) in view of Aarts (US PAT. 6,111,960) and Orban (US PAT. 4,412,100).

Consider claim 40, Aarts (131) teaches that a musical instrument preamplifier, comprising:

a) electronic filters (see fig.1) including a first filter network, the network including;

an input (10),

a plurality of outputs (110-160), and

a plurality of band splitter filter (110-160) to split a signal on the input into a plurality of different, substantially equi-phase (such as, no extra phase shifts or delay) frequency bands in which frequency bands (see fig.2) of substantially any frequency passed by one of said band splitter filter are substantially in phase in all of said bands (see page 4 line 7-page 5 line 32); but Aarts (131) does not clearly teaches that a plurality of band splitter filters and frequency bands in which frequency bands of substantially any frequency passed by more than one of said band splitter filters; and b) a plurality of non-linear circuits coupled to a plurality of the outputs to distort respective output frequency bands.

However, Orban teaches that a plurality of band splitter filters (see, 3, (14,16)) to split a signal on the input into a plurality of different (such as low pass bank and high pass bank) substantially frequency bands in which frequency bands of substantially any frequency passed by more than one of said band splitter filters are substantially in phase in all of said bands (col.5 line 1-col.6 line 66);

Therefore, it would have obvious to one of ordinary skill in the at the time the invention was made to utilize the teaching of Orban into the teaching of Aarts (131), so that the system provide the signal processor can generally be described as a distributed

crossover system for use with bandpass filters containing internal clippers. A unique (series/parallel) crossover configuration with favorable summation of properties is used.

On the other hand, Aarts (960) teaches a plurality of non-linear circuits (see fig.9 (23a-23n)) coupled to a plurality of the outputs to distort respective output frequency bands (24a-24n)(see col.9 line 3-col. 10 line 5).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to utilize the teaching of Aarts (960) into Aarts (131) to provide a circuit for processing an audio signal, wherein any non-linear device may be used as a harmonics generator for generating any selection of harmonics desired.

Consider claim 41, Aarts (131) teaches a preamplifier system comprising:

electronic filters (see fig.1) for splitting an input signal into plurality of different (such as 160 high pass bank and 110 low pass bank) substantially equi-phase (no extra phase shit or delays) frequency band outputs in which frequency bands of substantially any frequency passed by a plurality of band splitter filter are substantially in phase in all of said bands (see col.6 line 57-col.7 line 36), but Aarts (131) fails to teach a plurality of non-linear circuits coupled to said filters to distort respective output frequency bands.

However, Aarts (960) teaches a plurality of non-linear circuits (see fig 9, (23a-23n)) coupled to filter means to distort respective output frequency bands (24a-24n)(see col.9 line 3-col. 10 line 5).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to utilize the teaching of Aarts (960) into Aarts (131) to provide a

circuit for processing an audio signal, wherein any non-linear device may be used as a harmonics generator for generating any selection of harmonics desired.

On the other hand, Aarts (131) teaches one or more of the subsequent networks (see fig.1 (110-160)), the input of each is coupled to one output of another network via a filter to provide substantially equi-phase (no extra phase shit or delays) frequency bands on the network's outputs; with the center frequencies having substantially no phase shift when measured at the output of each band for the output (see col.6 line 48-col.7 line36), but Aarts (131) does not clearly teach the filters include a cascade of a first filter network, and one or more subsequent filter networks, each network including: an input, a plurality of outputs, and a plurality of band splitter filters to split a signal on the input into a plurality of different frequency bands for the outputs, and wherein outputs of some of the networks form frequency band outputs of the filters.

However, Orban teaches that that the filters include a cascade of a first filter network, and one or more subsequent filter networks, each network including:

an input (see fig.3, in), a plurality of outputs (10), and a plurality of band splitter filters (14,16,51,52) to split a signal on the input into a plurality of different frequency bands for the outputs, wherein for one or more of the subsequent networks, and wherein outputs of some of the networks form frequency band outputs of the filters (see fig.3 and col.3 line 19-col.4 line 56).

Therefore, it would have obvious to one of ordinary skill in the at the time the invention was made to utilize the teaching of Orban into the teaching of Aarts (131), so that the system provide the signal processor can generally be described as a distributed

crossover system for use with bandpass filters containing internal clippers. A unique (series/parallel) crossover configuration with favorable summation of properties is used.

Response to Arguments

9. Applicant's arguments with respect to claims 21-41 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Blum (US PAT 4,901,618) is recited to show other related the guitar preamplifier system with controllable distortion.

11. Any response to this action should be mailed to:

Mail Stop ____(explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Facsimile responses should be faxed to:
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Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (571) 272-7501 The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chin Vivian, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao,Lun-See
Patent Examiner
US Patent and Trademark Office
Knox
571-272-7501
Date 12-28-2005 L. S.

HUYEN LE
PRIMARY EXAMINER